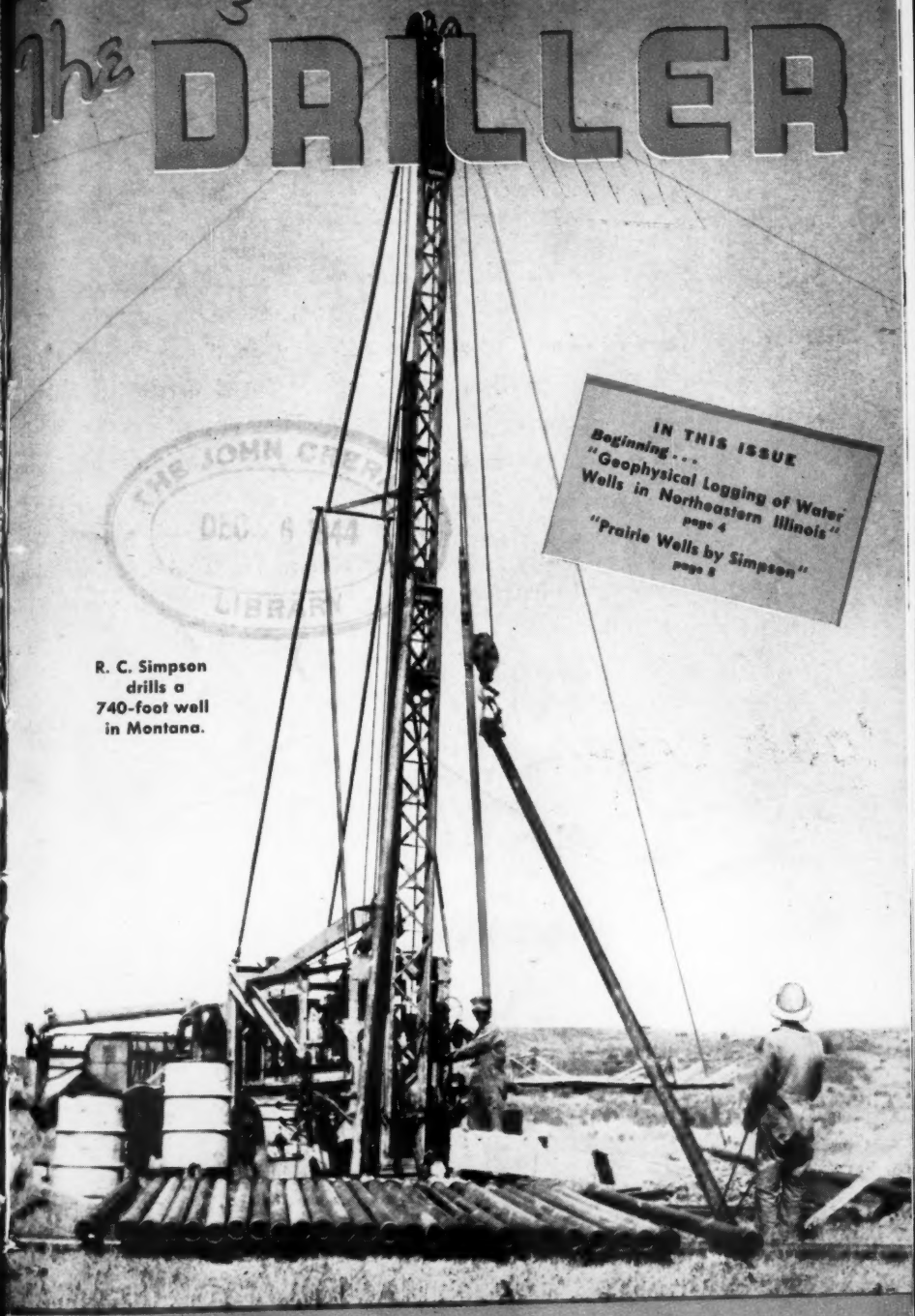
628.11
3

The DRILLER

THE JOHN CRERAR
DEC 6 1944
LIBRARY

IN THIS ISSUE

Beginning . . .
"Geophysical Logging of Water Wells in Northeastern Illinois"
page 4
"Prairie Wells by Simpson"
page 8

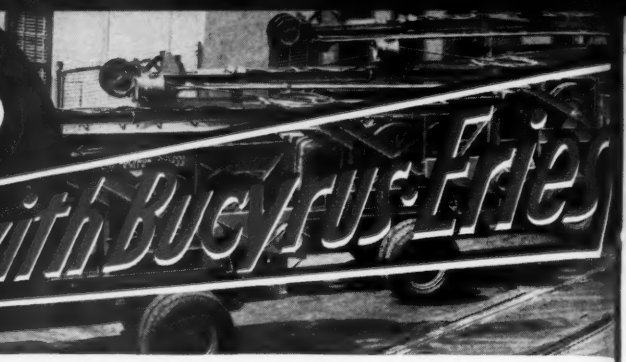


R. C. Simpson drills a 740-foot well in Montana.

COPYRIGHT 1944 BY EXCAVATING ENGINEER PUBLISHING COMPANY — PRINTED IN U. S. A.

VOLUME 18 DECEMBER, 1944 NUMBER 12

LOOK AHEAD to Greater Profits with Bucyrus-Eries



Businessmen with foresight — men who are looking ahead and planning their postwar futures — are looking over equipment in their fields, picking out the units they'll need, choosing the machines that will bring the most in profitable returns.

That's **your** cue to investigate the Bucyrus-Erie line of water well drills now and get the full story on the profit advantages they offer. Speed in making hole, in setting up, in moving, low cost operation and maintenance — in fact, all the performance features that bring you the best in profitable drilling — are yours with Bucyrus-Eries. That's why you can look ahead to greater profits if you include Bucyrus-Eries in your plans. J-6

Look Over "ALL THREE"

BUCYRUS-ERIE CO. SOUTH MILWAUKEE, WIS.
EVANSVILLE, IND.
ENGLEWOOD, N. J.

Distributors — Hilton Supply Co., Raleigh, N. C. . . . Mississippi Supply Company, Charleston, West Virginia . . . Lowe Gordon & Sons, Tampa, Fla. . . . R. R. Howell Co., Minneapolis, Minnesota . . . Lyons Machinery Co.,

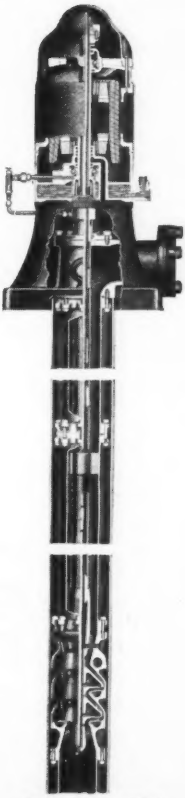
In large part
WATER Will Win War

In military camps, in defense plants, in Near East and Far East, in Lybia and Down Under, COOK Pumps are providing water for soldiers and workers, for mechanized equipment in the field and for meeting water requirements on the home front.

More than 60 years' experience in designing and manufacturing water-well equipment finds COOK prepared to serve in this unprecedented emergency.

6LSV5AT
COOK LS Pump with
42-gal. Pneumatic Tank

In connection with WATER SYSTEMS for the home, lawn, garden and barn COOK offers a full line of PLUNGER and EJECTOR pumps.



COOK Deep-Well
Turbine
ACE Type Head

GENUINE COOK WELL SUPPLIES

A. D. COOK, Inc.
-Outfitters for Wells-
LAWRENCEBURG INDIANA

DEEP-WELL COOK PUMPS

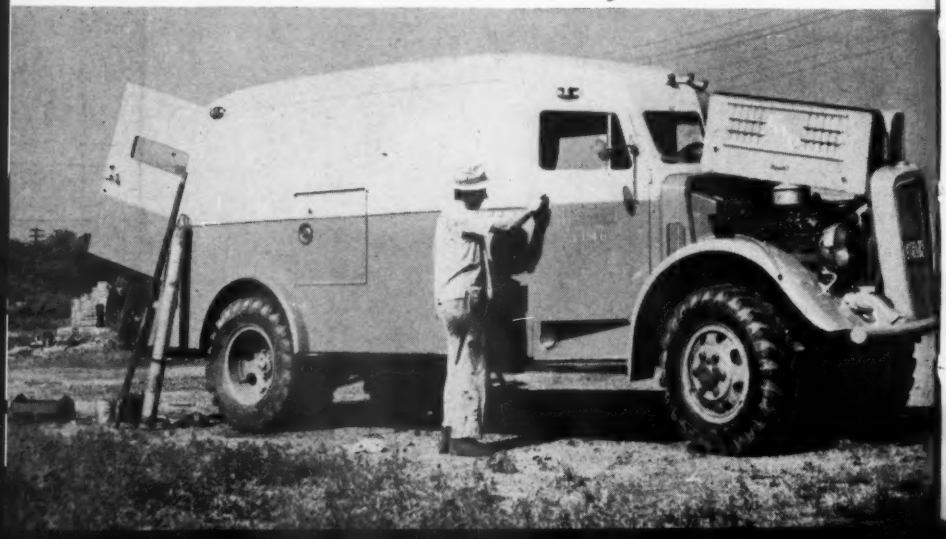
Geophysical Logging of Water Wells in Northeastern Illinois

CARL A. BAYS, Geologist and Engineer
and
STEWART H. FOLK, Associate Geologist,
Illinois State Geological Survey, Urbana, Illinois

The geophysical surveys made of Illinois water wells furnish factual material which, when properly integrated, permits sound interpretation of groundwater conditions. Such knowledge can be used to correct defects in old wells and to plan intelligent development and conservation of groundwater resources in the future.

EDITOR'S NOTE: *This is the first in a series of articles condensed from a paper presented to the Western Society of Engineers and published in its Journal for September, 1944. These articles will appear in* THE DRILLER *by special permission of The Western Society of Engineers and the Illinois State Geological Survey.*

BECAUSE of the many problems of groundwater supply in northeastern Illinois, a special study of the groundwater resources of the region was undertaken. Although data was available on the deep wells in this region, it was believed that many of the factors controlling the production of water in any well and the conditions that are regionally important were not known. Geophysical and geological methods for obtaining similar in-

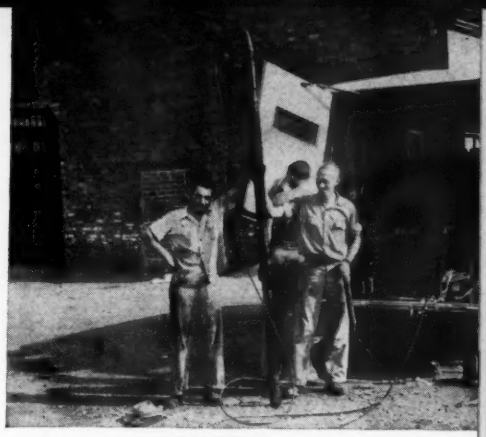


• This Four Wheel Drive truck was used by the Geological Survey for transporting equipment needed to run the well logs.

formation in the oil industry had been developed but had not been generally applied to the water well industry and practically no applications had been made in Illinois.

A program of experimental studies was set up to try the applications of these methods to water wells and to obtain as much information as possible on the producing zones and production conditions of deep wells in northeastern Illinois. Different tools and instruments were run in wells to obtain different types of data on the wall rock and fluids. As the investigations progressed there were developed a number of modifications of the usual techniques, measurements, scales and interpretative practices. In addition, tools and techniques were developed for particular water well problems. To these methods of logging the term "geophysical log" has been applied.

Geophysical logs have been made of more than 20 wells in northeastern Illinois, and from them many concepts that are essential to the understanding of water production have been worked out. The data have been closely integrated with geological and production data to give a sound basis for principles that have wide application and for recommendations on individual wells.



• The electrode being held up here is the standard logging electrode.

Geophysical Logging Methods

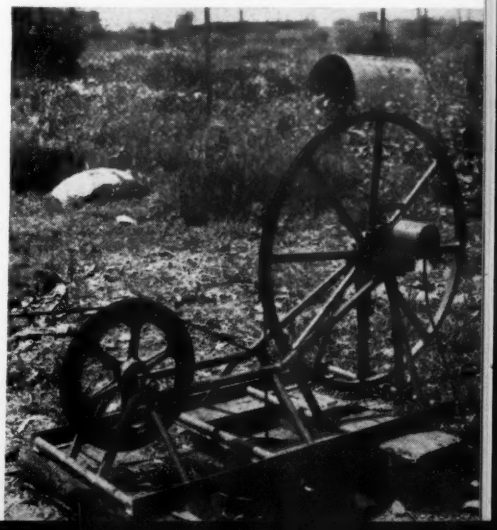
Logging Truck and Equipment

Geophysical well surveys are made from trucks completely equipped for the work. They have mono-conductor or multi-conductor cables for running the instruments into the well, a winch to spool the cable, and measuring devices to obtain correct measurements of depth. All measurements of conditions within wells are made electrically and are recorded photo-electrically with galvanometers as continuous curves on sensitized film or paper. The trucks carry their own power supply, usually both batteries and generator. The tools run into the hole are constructed for electrical measurement of various parameters to considerable depths under the hydrostatic pressure of the fluid column in a well.

Measuring Devices

In many wells no correct measurements of the casing, liners, producing zones, or total depth are

• Connected to the logging truck by an auto-synchronous system, this measuring sheave and counter was used to obtain accurate measurements.



• This rear view of logging truck shows spools for logging cable and electric lines.

available. Correct measurements play an important role in obtaining well data, and the measuring devices are a basic part of geophysical logging equipment. There are two types. Both are counter devices motivated by the sheave or sheaves over which the conductor lowering a surveying device into a well is run. In one type, the measuring device is connected to the camera in the logging truck and drives the film so that the depths are recorded photo-electrically. In the other type a self-synchronizing electric motor is used to operate the camera in coordination with the measuring sheave.

Electric Logs

Curves which record the electric potentials and the electric resistivities as measured in a well-bore constitute the "electric log." In most cases a potential curve and a resistivity curve are recorded simultaneously by means of a traveling electrode assembly that consists of several electrodes spaced differently. Usually they are drawn on the electric log so that the potential log is at the left and the resistivity curve is at the right. The "higher" or negative potentials are at the left side of the potential log and the positive are at the right; resistivity values increase to the right. Measurements indicative of the formations are obtained only in open hole. No record other than the presence of casing and liners is obtained inside of pipe.

Potential Logs

Measurements of potentials are made with a single pickup on the traveling electrode. The curves indicate the conditions which create potentials and may usually be attributed to any of several causes, chief of which seem to be electro-chemical phenomena. The principal use of potential logs is to determine the relative permeability of the different zones within wells, although in some wells the measurements yield considerable data on stray electrical earth currents which are important in the study of corrosion problems.

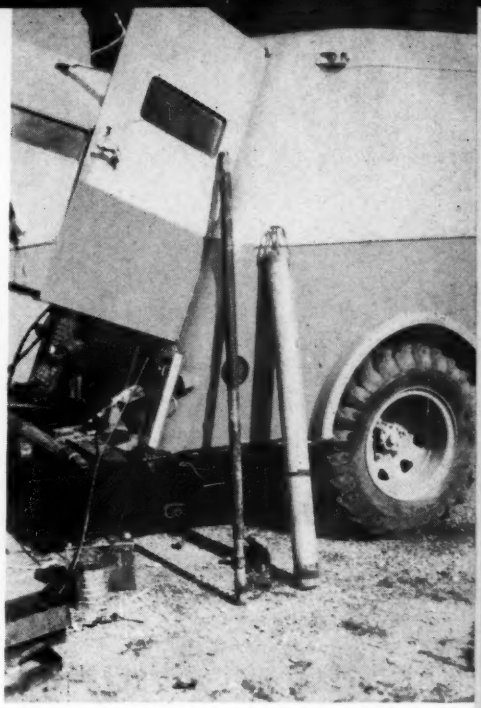
On potential logs the permeable zones, usually sandstones, creviced limestones or dolomites, have negative potentials "higher" than those of many fresh water wells where there is little circulation and no difference in composition between the water in the well-bore and the water in the porous zones penetrated by the well. In some of these wells the addition of salt to the water in the well-bore will increase the potential relief so the permeability may be recognized and the curve used. In other wells where a sufficient water volume is available at the well, a potential log made while keeping the hole filled with water has been the only usable curve by which to distinguish permeable zones. It is therefore desirable to run a "hole-filled" potential log wherever water

connections, fire-hydrants and hoses, or other supplies are available.

Resistivity Logs

There are several methods of measuring the apparent electric resistivity of the formations in a well. That most commonly used employs two potential electrodes and one current electrode, all combined in a traveling assembly which is lowered into the well, and another current electrode which is grounded at the surface. The potential or measuring electrodes are spaced from a few inches apart (for detailed logging of thin-bedded zones) to six feet or more apart for deeper penetration of the wall rock in order to investigate the character of fluids in porous formations beyond the zone invaded by fluid from the well-bore. Measurements made with closely spaced electrodes sometimes do not penetrate deeply enough into the formations to reveal their true character, and the measurements made with widely spaced electrodes fail to show thin beds. Another method employs a single traveling electrode and one electrode grounded at the surface. In all methods the resistivity measurements are affected by the character of the fluid in the well-bore and by the hole diameter, as well as by the character of the wall rocks and the fluids in them.

On most well surveys two or more electric resistivity logs are run, usually a so-called "normal" curve made with the potential electrodes closely spaced (ordinarily 18 inches apart) or with the single traveling electrode to obtain a detailed log, and a "third" curve with the potential electrodes from four to six feet apart to obtain information concerning the fluids in the formations. Where further information is needed, additional logs can be run with the electrodes only a few inches

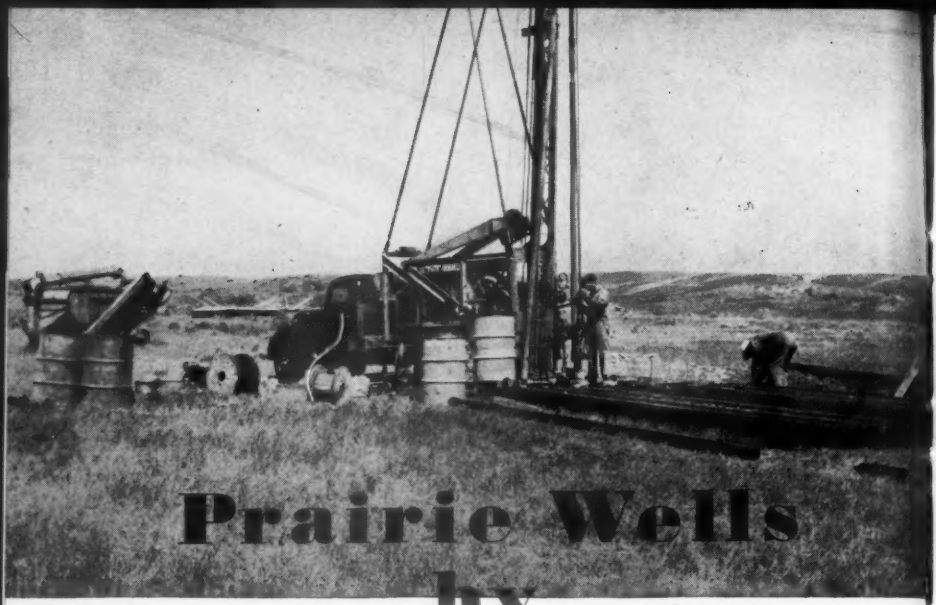


• **The electrode shown below (on left) is the small-size logging electrode; beside it is the salter.**

apart (the "auxiliary" curve) or with them more than six feet apart (the "lateral" or "fourth" curve).

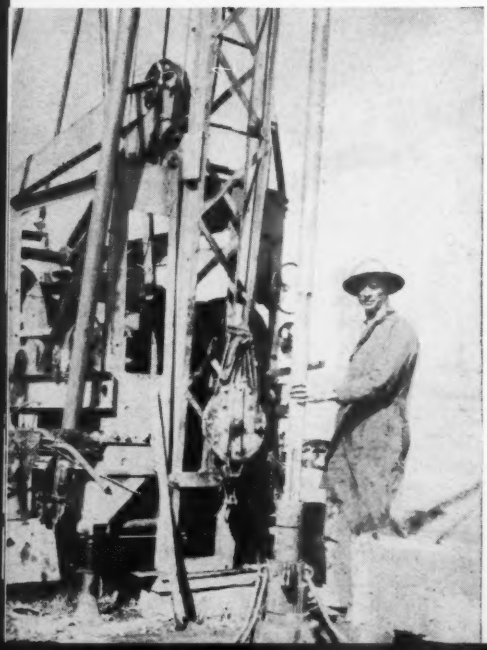
The resistivity curves are used primarily to log the wall rock in wells, but from them the character of fluids (fresh water, salt water, oil, gas) can be surmised, and the location of casing and liner in the hole can be determined. Non-porous non-argillaceous materials, such as most limestones and dolomites, have high resistivity values; shales and other argillaceous materials have low resistivity values; the resistivity values of porous rocks such as most sandstones and some dolomites and limestones depend largely upon the amount and character of the contained fluids, and generally are intermediate between the high values of limestone and the low values of

(Continued on page 20)



Prairie Wells by Simpson

Drilling in the wide open spaces is a "long haul" proposition as this contractor's territory of some 22,500 square miles attests. There are access problems too, but as long as the footage is good, it's drilling as R. C. Simpson likes it.



WHILE he doesn't claim any records, R. C. Simpson of Malta, Montana, admits he "occasionally does pretty well" in the matter of drilling footage in a business which serves a 150 mile-square block around Malta — out where the West has really begun and a good many of the roads are only prairie trails.

To back up his statement, Simpson points to a number of performances that are certainly "pretty good" even for soft formations: 138

• R. C. Simpson on the job, drilling what turned out to be a 4-inch flowing well that was completed at 740 feet in 1944. The well was put in for Towns Brothers, Montana, ranchers located near Malta.

ft. in one day (two men, using a Bucyrus-Erie 21-W); 120 ft. in one afternoon (Bucyrus-Erie 33-W, two men); 120 ft. in ⅔ of a day (Bucyrus-Erie 22-W, one man); 115 ft. in one afternoon (Bucyrus-Erie 22-W, two men); 630 ft. on two wells in eight days (Bucyrus-Erie 22-W, two men).

That's putting down wells with the kind of speed that makes drilling profitable and brings Simpson all the work that he and his helper, Pershing (Bud) Jacobsen, can handle.

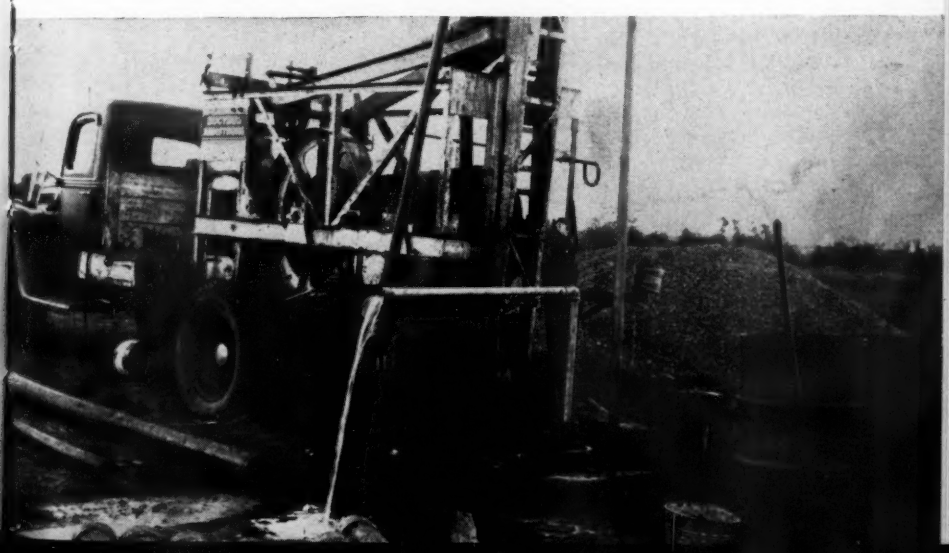
Most of Simpson's wells are farm and stock wells of 4 inch diameter, although he occasionally drills 6-inch wells for suburban residences and stock yards. His usual yearly footage has been around 3000 feet until 1943, when, in spite of the fact that he had to work without a helper, he drilled 3800 feet. In the first six months of 1944, with the experienced Bud Jacobsen to help him, Simpson had already drilled 4000 feet!

Occasionally Simpson drills what he calls "feed yard wells." By way of explanation, these are wells whose water is used to feed sheep. Ordinarily the sheep are fed beet pulp from sugar factories; because the pulp itself is wet, very little water is needed. In the last years, however, the shortage of beet pulp has made the demand for water greater. The fact that few sheep yards included wells brought Simpson some additional business. He drilled eight wells of this type, varying from 40 to 300 feet deep, and each watering between 2000 and 4000 sheep.

Simpson at present has only one machine — a Bucyrus-Erie 22-W mounted on a 1938 1½-ton Ford truck. The truck has plenty of power for ordinary travel but once in a while out on the prairie or near the Little Rocky mountains, or the Bear Paw mountains, Simpson runs into grades that are a little too tough. The solution then is to hook on the Simpson pick-up truck in the front to help pull.

Recalling his toughest access problem, Simpson says, "We had to get into a ravine between hills on a steep road built especially for us by a rancher who knew definitely where he wanted his well drilled. We had to back up because there was no

(Continued on page 17)



• Before obtaining his Bucyrus-Erie 22-W in 1941, Simpson drilled with this 21-W, shown on a 476-foot well in 1940.

The DRILLER

A JOURNAL FOR WATER WELL DRILLERS

Published every month by:
Excavating Engineer Publishing Co.
South Milwaukee, Wisconsin

Single copies 25 cents
Subscription price $1.00 per year.
Canada and Foreign. $2.00 per year.

F. O. Wyse, Publisher
M. B. Jaeger, Editor
E. M. Heuston, Sales Manager

Consulting Editors
G. R. Watson **W. J. Walsh**

Address Communications to:
The Driller, South Milwaukee, Wis.

Vol. 18 December, 1944 No. 12

Below Normal Levels Continue

IN September, ground water throughout most of the eastern and southeastern United States, and also in parts of the midwest, continued at below-normal levels according to the Water Resources Review of the Geological Survey. Notable exceptions were in northern and western North Carolina and southern Virginia. In the Dakotas, and in most of Nebraska, Iowa, and Kansas, water levels were above normal at the end of September. Elsewhere the trend of water levels was shifting seasonally.

In some areas of moderate or heavy pumpage, ground water levels were low, or below normal, in key wells in those areas. Such areas were Memphis, El Paso, and southern Arizona. On the other hand, in areas of pumping in southern California and in Utah, water levels at the end of September were high for this time of the year.

Stone Returns To Englewood

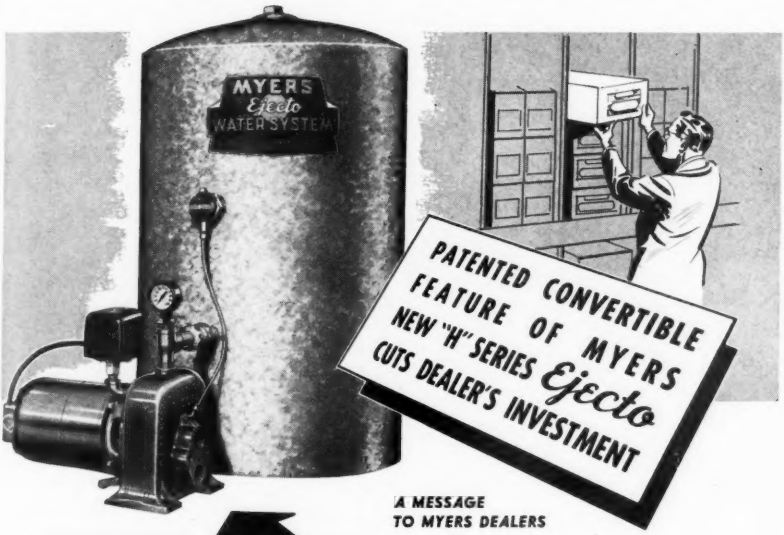
SELDEN A. STONE, Bucyrus-Erie Drill Sales representative for the East, has returned to his headquarters in Englewood, New Jersey, according to an announcement by Bucyrus-Erie Company. Mr. Stone's return to the Bucyrus-Erie Parts Service Station, 214-216 South Dean Street, follows a period of several months during which he was located at the company's District Office in Pittsburgh, Pa.

At the service of all drillers in his territory, Mr. Stone urges them to write, phone or wire him whenever his assistance is required.

Corrosion Data

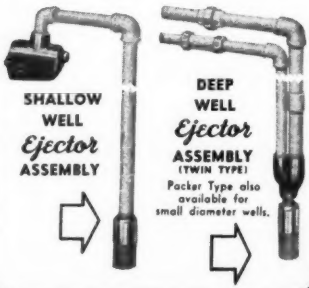
INFORMATION on controlling problems of scale and corrosion in engine jacket cooling systems is contained in two articles appearing in the September issue of the H-O-H Lighthouse, house organ of the D. W. Haering & Co., Inc. The results of tests by one of the nation's major railroads is covered by one article on Diesel Engine Cooling Water Treatment. The second is a very informative article on "Scale and Corrosion Control in Engine Jacket Cooling Systems" and is valuable for the library of every operator of water cooled equipment. Write D. W. Haering & Co. Inc., 205 West Wacker Drive, Chicago 6, Illinois, for your copy.

LOWER INVENTORY!



The SAME PUMP for SHALLOW or DEEP WELL SERVICE!

SIMPLY ATTACH PROPER *Ejector* ASSEMBLY


SHALLOW WELL Ejector ASSEMBLY
DEEP WELL Ejector ASSEMBLY (TWIN TYPE)
Packer Type also available for small diameter wells.

A MESSAGE TO MYERS DEALERS

The *same pump and motor* for shallow or deep well installations — that means a substantially reduced investment for Myers dealers. Simply by attaching the proper ejector to the pump and tank assembly it becomes either a shallow or deep well system. By stocking fewer pump and motor units — and extra shallow and deep well assemblies — a wide range of conditions can be met with minimum inventory. Pump and motor assembly — and all Ejector assemblies — are packaged separately. More convenient to stock and handle; require less stockroom space.

Through advanced designing and construction, many unusual features are provided in the new Myers "H" Series Ejecto. It's a distinguished new leader, insuring increased sales and better profits for Myers dealers.

***NOTE:** Under wartime restrictions and present maximum production capacity, it is Myers policy to confine current production to Myers dealers and distributors only.*

THE F. E. MYERS & BRO. CO., Dept. C-48, ASHLAND, OHIO

NEWS OF THE MONTH

Air Conditioning Topic Treated

HOW to plan postwar air conditioning to control temperature and humidity, clean the air, and provide adequate ventilation and air circulation is discussed in a new 16-page illustrated booklet announced by Westinghouse Electric Elevator Company.

The booklet tells how air conditioning works, outlines the principal factors which must be considered to plan air conditioning for a specific application, and pictures and describes equipment including compressors, condensers, units and coils.

Copies of the new booklet "How to Plan Your Postwar Air Conditioning Today" may be secured from the Westinghouse Elevator Company, 150 Pacific Avenue, Jersey City 4, N. J.

Drillers' Supply Co. Joins Bucyrus-Erie Dealer Organization

APPOINTMENT of Drillers' Supply Company, Joplin, Missouri as distributor for Bucyrus-Erie water well drills and drilling and fishing tools was recently announced by Bucyrus-Erie Company.

Drillers' Supply Company will handle Bucyrus-Erie 21-W, 22-W, and 24-L water well drills in a territory covering southwestern Missouri, the southeast corner of Kansas, northern Arkansas, and Oitawa county in Oklahoma. Service to the territory will be maintained through the company's office and sales room at 820 East Fourth Street, Joplin.

Drillers' Supply Company subscribes to a policy of supporting all sales with first class service and will be glad to help contractors with drilling equipment problems at any time.

Warren Made Delco Ad. Mgr.

THE appointment of Julian Warren as Manager, Advertising and Sales Promotion, has recently been announced by the Delco Appliance Division, General Motors Corporation, Rochester, N. Y. Mr. Warren has been associated with the Division for several years in sales and executive work.

Reports Prevalence of Contamination

THE importance of proper construction and location of water wells was again emphasized when it was revealed recently by K. C. Lauster, acting director of the division of sanitary engineering of the North Dakota state health department, that more than 50% of water samples from private wells submitted for testing in North Dakota in the past year showed contamination.

Stressing the fact that a well to be safe must be properly located, carefully constructed, and watchfully maintained, Lauster pointed to location of wells in pits or basements as an invitation to contamination. He cited watertight construction to a depth of at least ten feet from the surface as essential. The danger of

serious illness, such as typhoid fever, was pointed out as a possible result of using contaminated water.

The basis for Lauster's report was a tabulation of samples received for testing by the North Dakota health department in the past year.

New Clark Catalog

THE Robert H. Clark Company of Beverly Hills, Manufacturers of Clark Cutters, announces the release of a new Adjustable Cutting Tool catalog. Printed in two colors and profusely illustrated with diagrams and photos of actual operations, the catalog contains complete specifications and prices, as well as detailed descriptions of the entire line of Clark Adjustable Cutting Tools.

Ponder Appointed By Bucyrus-Erie

APPOINTMENT of G. E. (Bert) Ponder, Odessa, Texas, to a position in its drill sales organization was recently announced by Bucyrus-Erie Company, South Milwaukee, Wisconsin. He will be stationed at the company's Dallas, Texas, office in charge of oil well spudder sales in the Dallas territory.

Mr. Ponder brings to this new position more than 16 years of experience in the cable-tool drilling field. His background includes association with such prominent firms as International Supply Company and Bethlehem Steel Company. Immediately before joining the Bucyrus-Erie organization he had been conducting his own drilling and well-servicing business at Odessa.

At the service of Bucyrus-Erie customers and prospects in the Dallas

(Continued on page 20)

Add life to your wire lines with LUBRICATION

● Every American TIGER BRAND MOR-SPRING Wire Line comes to you from the factory, properly lubricated and ready for service. But factory lubrication, no matter how efficient, will not last the life of the line. Field lubrication at regular intervals is absolutely essential. Wire rope is a machine, composed of many working parts. It requires periodic lubrication to reduce frictional wear.

Use a well-tested lubricant like Tiger-Lube which has been developed through years of study and research. Be sure that the line surface is clean and that the lubricant is applied uniformly and thoroughly.

Lubrication is insurance against corrosion and is the safest way to prevent excessive internal and external line wear.

AMERICAN TIGER BRAND "MOR-SPRING" WIRE LINES

AMERICAN STEEL & WIRE COMPANY
Cleveland, Chicago and New York
COLUMBIA STEEL COMPANY
San Francisco
United States Steel Export Company, New York
UNITED STATES STEEL

FROM THE MAILBAG

drilling, driving pipe, dressing bits, etc. All letters will be answered promptly by experienced drillers and engineers who are qualified to give intelligent advice on these subjects. We will publish as many letters of general interest as space

Sirs:

In my drilling I am troubled with boulders and with bits sticking occasionally. Do you know of any literature that will be of help? Any information you can give me on how to overcome this difficulty will be appreciated.

W. H. B. **Minn.**

In the first place, to our knowledge there is no booklet or manual published that is devoted generally to the subject of water well drilling. As a matter of fact, due to varying conditions in different sections of the country, such a manual would not be of a great deal of help as all drillers do not encounter the same difficulties.

For instance, only a small minority of drillers might have trouble with boulders, depending on the locality.

As a general rule small boulders will not give a great deal of trouble but when large boulders are encountered, these must usually be blasted out of the way in order to get the pipe down. If the boulder is encountered while drilling four or more feet ahead of the pipe a charge can be fired without danger of injuring the end of the pipe but if the pipe is seated on top of boulder, it will be necessary to draw it back four or five feet before the explosive charge is set off.

Four or five pounds of 40% dynamite placed in the hole up to the boulder and fired will usually force the boulder far enough out of the way to allow the pipe to pass. If you are unfamiliar with the handling of explosives, we suggest you secure the services of someone to instruct you as it is dangerous to handle by someone who has never had any experience in blasting.

If your bits stick in the formation you are drilling, this is doubtless caused by the way you dress them, that is they apparently are not shaped properly to suit the formation being drilled.

In this connection we believe the instructions and suggestions contained in Bucyrus-Erie drilling tool catalog No. 642, pages 46 to 48 inclusive, will be helpful to you. It is just as important that the bits be shaped properly as heating and tempering. We believe, therefore, if you will follow carefully the suggestions for shaping your drill bits as outlined in the tool catalog that you will be able to overcome the difficulty you speak of.

Air Conditioning Guide Offered

THE Minneapolis - Honeywell Regulator Company is offering dealers, jobbers, architects and engineers a new Engineering Guide of the Moduflow Control System for air conditioning and home heating, dealing with the engineering phases of the various Moduflow methods, including the new Reset Method.

A distribution of about 30,000 booklets is planned, it was announced.

I SURE HOPE OUR POSTWAR LINE HAS ALL THE NEW DEVELOPMENTS COMPETITION IS TALKING ABOUT!
ME, TOO. GOLLY, BUT JOE IS LUCKY. HE KNOWS THAT WHEN THERE'S ANY-THING NEW AND BETTER IN HIS BUSINESS, DELCO-APPLIANCE WILL HAVE IT!
DELCO
XYZ RADIO

Mark well those two words . . . NEW and BETTER. Separately they may mean little when applied to manufacturing developments. Together they can spell leadership . . . such as Delco Water Systems have long enjoyed.

Delco Water System dealers, present and future, can be sure of one thing—that whenever new *and* better developments take place in this particular industry, Delco Water Systems will have them.

Right now Delco Appliance is planning water system equipment designed to fit modern postwar homes and buildings, and for the modernization of older ones. And these products can be counted on to keep pace with industry . . . to afford Delco Water System dealers an expanding and profitable business not only in the immediate postwar period, but in the years to come.

It will pay you to find out if a Delco Water System franchise is still available in *your* community. Address your inquiry to Delco Appliance Division, General Motors Corporation, Rochester 1, N. Y.

A WAR HALF WON IS NOT A VICTORY. KEEP ON BUYING WAR BONDS!

PRODUCT OF GM GENERAL MOTORS

DELCO WATER SYSTEMS

WIT BITS

"What's the idea of sticking me in a ward with that crazy guy?"

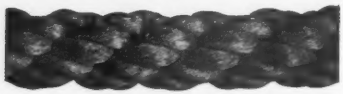
"Well, the hospital is rather crowded just now. Is your roommate troublesome?"

"Why, he's nuts. He keeps looking around and saying, 'No lions, no tigers and no elephants'—and all the time the room is just full of them."

He had hard luck fishing, and on his way home he entered the fish market and said to the dealer, "Just stand there and throw me five of the biggest of those trout." "Throw 'em? What for?" asked the dealer in amazement. "So I can tell the family I caught 'em. I may be a poor fisherman, but I'm no liar."

FITLER

COMMANDO BRAND SISAL DRILLING CABLE



for use in water well and blast hole drilling is especially constructed to give it plenty of spring and is lubricated against internal friction.

If your dealer cannot supply you—write direct for information.

THE EDWIN H. FITLER CO.
Established 1804
5625 Tacony Street
PHILADELPHIA 24, PA.

A warehouseman in a small country town received a shipment on which was a donkey, described on the freight bill as "one burro." After checking his goods carefully the agent made his report: "Short one bureau; over one jackass."

Old Lady (on platform): "Which platform for the London train?"

Porter: "Turn to the left and you'll be right."

Old Lady: "Don't be impertinent young man."

Porter: "All right, then, turn to your right and you'll be left."

You never can tell—maybe a fish goes home and lies about the size of bait he stole.

The patient was getting better. He had asked repeatedly for food and finally the nurse served him a mere spoonful of rice.

"That was wonderful," he said as he finished. "Now bring me a postage stamp. I want to read."

"I don't know what to make of my husband," said the cannibal queen.

"Have you tried this recipe?" said her dearest friend.

An Irishman carrying a large sack of potatoes along a lonely road was overtaken by a man driving a team hitched to a wagon. The driver offered Pat a lift, which he gladly accepted, but still kept the sack of potatoes on his back. The driver told him to put them down in the wagon.

"Sure," replied Pat, "I'm thankful for the lift ye gave me, but I don't want ye to be burdened with the taters, too."

Prairie Wells . . .

(Continued from page 9)

place to turn around once we managed to get the drill located. For this reason, too, we couldn't possibly use the pick-up to help us out this time.

"After a lot of figuring, we decided to try using the casing reel and line on the drill to help us up the hill. Once we found a place to attach the line, our troubles were over. Both truck and machine went up the hill easily."

While this particular job was unusual, even more so was the well Simpson put down in the winter of 1936 for the Fort Belknap Agency at Harlem, Montana. At a depth of 108 feet, there was every indication that a plentiful supply of water would be obtained soon — in fact, there *was* water at that depth but it contained too much sand.

Drilling, however, had to be temporarily abandoned at that point because of a lack of casing. Since the well was being drilled on the Fort Belknap reservation, the government was furnishing the casing and had not supplied enough to complete the job. While waiting for the casing, Simpson halted work for a few days.

When he returned to the well, there were unmistakable signs that the well had flowed during his absence: ice had formed around the machine. Upon resumption of drilling it was discovered that the water level was only a few feet below the surface of the ground.

Simpson drilled down only four more feet and struck a vein of water in gravel that produces a flow of 20 gpm and was still flowing almost eight years later. The well, used to supply water for drinking as well as watering of stock, was a four-incher, finished in gravel without a screen.

Gravel is plentiful in Simpson's

ATTENTION DRILLERS!

We don't need to tell you that even a very fine well is just a headache when equipped with an unsatisfactory pumping unit. The JENSEN Water Well Unit, made by the world's oldest and largest exclusive manufacturer of pumping equipment, is your best insurance. Drillers everywhere recommend it. It makes water from any good well cheap and dependable.

JENSEN BROS. MFG. CO.

14th and Pacific Streets, COFFEYVILLE, KANSAS, U. S. A.

EXPORT OFFICE: 50 CHURCH ST., NEW YORK CITY, NEW YORK

territory because of the presence of glacial drift which, with sandstone and shale, comprises the formations in which he drills. The drift varies in depth from a few feet to around three hundred feet, and the sandstones are found at various depths beneath the overlying shale formation.

Such formations pose their share of drilling problems, as do the hard rock, clay, etc., found in other drillers' territories. As evidence, Simpson cites a well he put down in 1942 near Chinook, Montana. A 4½-inch well (Simpson no longer drills this size), the job brought trouble at 150 feet when the drill bit struck a layer of rock and became stuck.

Stayed on the Job

The fact that this occurred at 9:30 in the evening didn't make Simpson particularly happy, but in spite of the hour, he stuck to the job in an effort to free the tools. Running down a bumper on the sand line and jarring the tool string brought more grief as the bumper became detached from the line and stayed in the hole.

But still Simpson didn't give up. He ran down a fishing tool, fished out the bumper bar, put it back on the sand line, and finally got the tool stem jarred loose the same night. Many times, since, he's been thankful that he stayed with it, because examination of the hole the following morning revealed that there were several feet of cavings in the hole. What this would have meant by way of additional fishing troubles had he left the tools for the night, Simpson hates to contemplate.

Incidentally, this well was drilled within fifty feet of another well which had obtained water at 120 feet but was no longer in use. The new well produced no water even at a depth of 250 feet, so Simpson called a halt, moved his rig to a spot alongside the old well, drilled to 120 feet —and got water. The flow was 5 gpm.

Drilling at night is not unusual for Simpson, in fact some of his "days" begin at 5:30 in the morning and end around midnight. To make the night work possible, Simpson has a portable, 110-volt light plant which he takes with him out on the job. For a beam to shine up on the derrick he uses old automobile sealed beam units which he takes apart, using the metal reflector to produce his "spot."

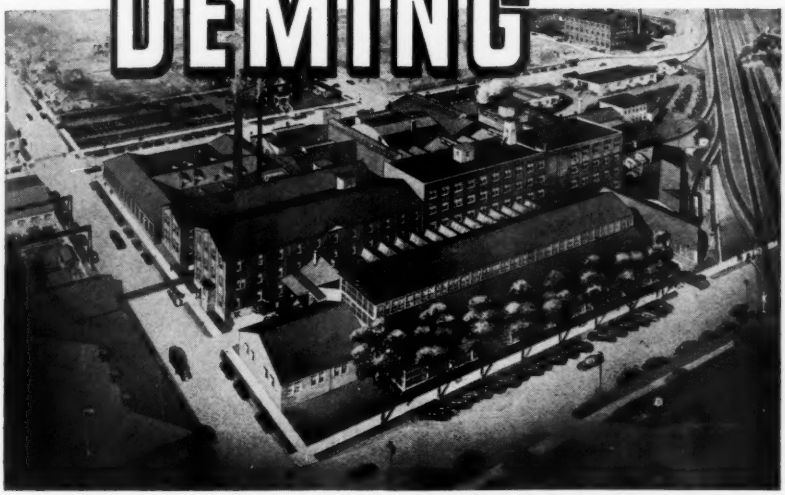
While almost all of Simpson's work is water well drilling, he sometimes picks up a job which involves no attempt to obtain water at all. An example of this type of job is the ventilating shaft he drilled near Harlem. The customer claimed that the ground was so tough that he couldn't put in the shaft himself, but when Simpson had his machine set up, it required only a few minutes to complete the twenty-foot shaft.

Father a Driller

Simpson's drilling "know how" isn't accidental. His father — C. A. Simpson of Bisbee, North Dakota— began drilling in 1906 and is still very active in the industry. The younger Simpson learned drilling by helping his father, beginning when he was 12 years old. In 1935 he began drilling for himself on a part time basis. This meant that he couldn't keep a steady helper with the result that much of his drilling was done solo.

Since buying his Bucyrus-Erie 22-W in 1941, Simpson has drilled about 120 wells and now has an experienced, able helper in Bud Jacobsen, who frequently relieves the contractor in operating the machine. That means "full speed ahead" for the future, with indications that the coming years will bring a good many more Simpson wells in Montana.

DEMING



The Deming Factory, Salem, Ohio

THE COMPLETE LINE

Shallow and Deep Well Pumps and Water Systems

Jet-Type Pumps and Water Systems

Turbine Pumps (Water Lubricated) for Deep Wells

Centrifugal Pumps in a wide range of types and capacities

Cellar Drainers and Sump Pumps

Rotary and Oscillating Pumps (hand and power)

High Pressure Pumps

Special Service Pumps

Hand and Windmill Pumps

ONE SOURCE for ALL pumping equipment

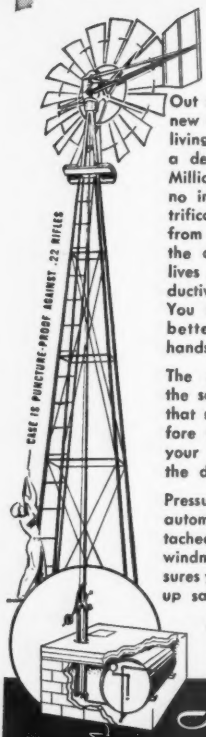
★ You, as a well driller, can meet *ALL* pumping needs of *ALL* farms, *ALL* suburban areas, and practically *ALL* commercial, industrial, and institutional needs with DEMING—*The COMPLETE Line* of pumps and water systems.

Every Deming Pump is built to meet exacting standards which assure your customers maximum pump value per dollar of investment.

Make *DEMING* your *ONE SOURCE* for *ALL* pumping equipment. Write for complete catalog.

DEMING
THE COMPLETE LINE
PUMPS AND WATER SYSTEMS
The Deming Company • Salem, Ohio

SKY POWER
AUTOMATIC WINDMILL
WATER SYSTEM



Out of this war is coming a new era of comfortable farm living — a higher standard, a desire for better things. Millions of farm families with no immediate hope of electrification want running water from sky power . . . to take the drudgery out of their lives . . . to increase the productiveness of their farms. You can supply them with better living and reap a handsome return.

The present Monitors have the same storm-safe features that made them popular before the war. Start getting your share of sales while the demand is at its peak.

Pressure water systems, with automatic control, can be attached in the future to the windmills you sell. This assures you of profitable follow-up sales to be made later.

Ask your nearest Baker branch.

Monitor
SKY POWER WINDMILL WATER SYSTEM

THE Monitor LINE
DEEP WELL WATER SYSTEMS • WINDMILLS • HAND PUMPS • PUMP JACKS • ENGINES • WATER WELL SUPPLIES

★

• BRANCHES •
BAKER MFG. CO.: Minneapolis, Minn.; Madison, Wis.; Fort Dodge, Ia.; Cedar Rapids, Ia.; Omaha, Neb.; Kansas City, Mo.; Enid, Okla.; Hutchinson, Kansas
BAKER MFG. LTD., Winnipeg, Canada
AXTELL CO.: Fort Worth, Tex.; Amarillo, Tex.; Lubbock, Tex.; San Angelo, Tex.

BAKER MANUFACTURING CO., EVANSVILLE, WIS.

Ponder . . .

(Continued from page 13)

territory, Mr. Ponder will work closely with authorized Bucyrus-Erie distributors to render sound assistance on drilling equipment problems. His appointment became effective November 1st.

New Packaging Idea

IN developing their newly designed "H" Series Ejecto water system, The F. E. Myers & Bro. Company of Ashland, Ohio has introduced new packaging and inventory ideas as well. The pump and motor as well as the Ejector Assembly Units are neatly packaged in cartons, and end-labeled so they may be easily located when shelved. Each type of ejector Assembly — Shallow Well, Deep Well (Twin or Packer Type) —is packaged in a separate carton, the manufacturer reveals. The newly patented convertible feature utilizes the same pump for either shallow or deep well installations by attaching the proper ejector assembly. The motor and centrifugal pump comprise the central unit in either adaptation.

Logging . . .

(Continued from page 7)

shale. The resistivity of metallic objects such as casing is low. Close correlation of well-cuttings and resistivity curves through any zones in a number of wells gives a basis for interpretation of the curves along through equivalent zones in wells where samples are not available.

Fluid Temperature

Temperature logs are made with continuously - recording resistance thermometers which record the temperature of water in the well as a

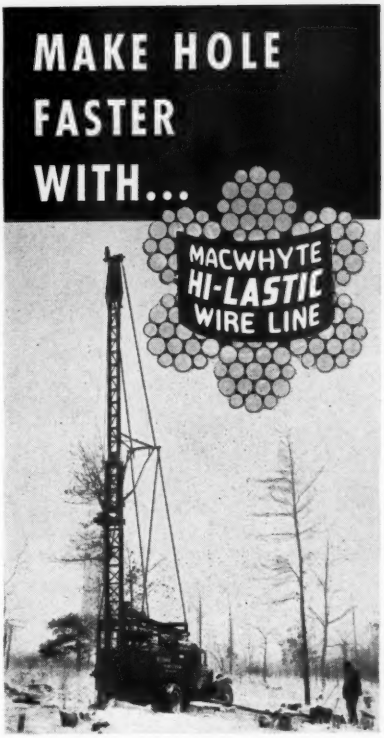
curve. From these logs the temperature of water from the aquifers may be recognized. In most wells surveyed the temperature curves are interpreted as indicating circulation conditions or geological conditions in the well or producing conditions in adjacent wells at the time of logging.

In many wells, thermometers are affected by "noise" or stray earth currents so that minor variations and irregularities not indicative of temperature changes in the fluid are recorded. These may mask irregularities which are related to actual temperature changes. Therefore, in drafting and interpreting temperature logs, particularly in the industrial sections in and near Chicago, such minor variations are disregarded.

In one well surveyed recently a temperature log was run while water was flowed into the well from the surface. From the log, the zone where most of the added water was leaving the hole was recognized and was thus identified as the principal aquifer.

In oil wells the principal use of temperature logs has been to locate the approximate top of cement behind the casing. The method is based upon the fact that the heat generated during the setting of the cement produces a marked increase in temperature of the fluid within the casing at the top of the cement. Temperature logs have been used for this purpose in a few water wells and undoubtedly will be so used to a greater extent in the future. The advantages of cemented casing are now recognized, and more and more casing strings are being cemented.

The second in this series of articles on Geophysical Logging of Water Wells will appear in an early issue.—The Editor.



Macwhyte "Hi-Lastic" enables you to carry tools higher. It's the perfect drilling line for blast hole and shallow water well drilling. "Hi-Lastic" has extra elasticity—to let the tools strike hard, fast blows. "Hi-Lastic" helps reduce tendency for the hole to get out of round, and for the bit to channel. With "Hi-Lastic" on your rig, a manilla cracker is unnecessary. Macwhyte "Hi-Lastic" drilling lines are internally lubricated.

●

For deep well drilling Macwhyte Standard Cable-Tool Lines have the right elasticity to strike long, hard, sharp blows.

●

For fast bailing use Macwhyte Sand Lines. Coarse laid (6 x 7) and soft laid (6 x 19), Mild Plow Steel. No. 762

MACWHYTE COMPANY

2939 Fourteenth Avenue
Kenosha, Wisconsin
The CORRECT line
for your equipment

BARGAIN COUNTER

To the reader who wishes to advertise used equipment in "Bargain Counter" Section. All advertising in this section is payable in advance. Enclose your check or money order with copy. Rate: 30c per line. Minimum charge $1.20. No discounts; no commissions. Read these instructions carefully. The average line contains 28 characters (20 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number if blind advertisement is desired. Count your own copy to save delay. Holding up your advertisement one month to secure approval of revised copy or an additional remittance, may cost you real money in a lost sale. Be sure to enclose the correct amount of money with your order. Closing date—15th of preceding month. Example—January issue closes December 10th.

To the reader wishing to answer "Bargain Counter" Section advertisements appearing on these pages: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of THE DRILLER, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

DRILLS

One 3½ Keystone drilling machine in good condition. Traction mounted on solid rubber tired wheels. Clutch hoist, 4 cyl. Waukesha engine. Ideal for blast hole work. Located in Maryland. Box 4412

One 72-ft. bolted Spruce standard rig, all timbers fir, with 8 horsepower Cyclone engine, natural gas or gasoline burning carburetor, complete with all standard tools, boats and doghouse. Rig is in A-1 shape and operating at present. Box 4512

WISCONSIN — Sparta Drill 300'-500' capacity, wood frame, 33' derrick with shock absorber. LeRoi 2 cylinder gasoline engine, solid tired semi-trailer mounting with Ford truck. Located near Milwaukee. Price without tools, $700.00. Box 4911

MISC.

Between 75 and 100 new standard galvanized 4" couplings recently removed from 4" galvanized pipe and replaced with well drillers' couplings. Also two heavy duty jack screws; 30 inches high; 3-inch screw; almost new. Clarence Chadwick, Deford, Michigan.

WANTED

Wanted: Bit Dresser. Give full particulars, price, etc. Barney A. Moravec, Penn Yan, New York.

WANTED

Wanted: Two No. 21-W and one 33 or 22-W Bucyrus-Erie well machines either with or without tools, with or without trucks. Also extra power hoist for 21-W and for 33-W. Box 4312

WANTED TO BUY—One Bucyrus-Erie 21-W Drill, truck mounted, with or without tools. State condition and price. Box 0417

Wanted: Steel well drill, truck mounted, and tools for 5⅝" and 6" holes. J. Bihn & Son, Stony Ridge, Ohio.

Wanted — Armstrong No. 35-W or Bucyrus-Erie 21-W or 33-W drill. Machine must be in good condition. Please advise location, equipment included and price. Box 4612

HELP WANTED

Wanted, an energetic young or middle aged driller capable of looking after two or three well machines on the Eastern Seaboard. The drilling will be principally rock, but may be some sand drilling. Payment will be on a salary and commission basis, which will make up a total well above the average driller's wages. If interested, please write. Box 4212

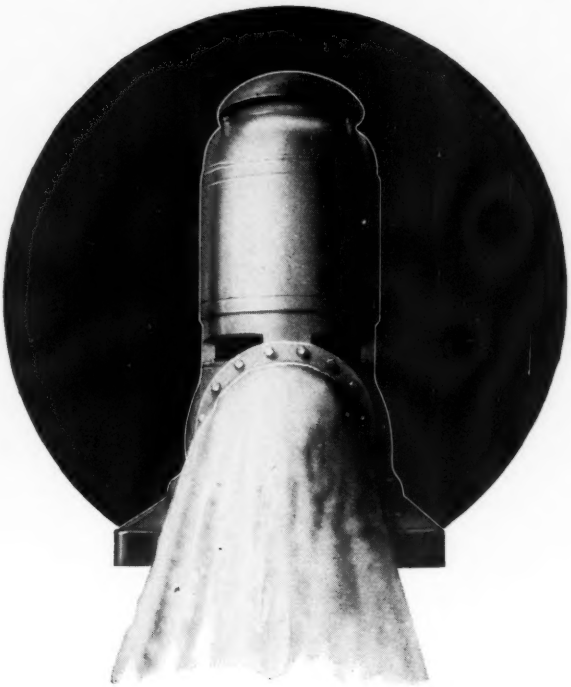
Driller wanted. Steady work. Age no objection. Must be of good habits. Give all information in your letter. Trotter - Gill Drilling Co., Carlinville, Illinois.

Wanted — Experienced well driller for year around work in Connecticut. $1.25 per hour. Good working conditions with modern machines. Louis E. Allyn, East Canaan, Connecticut.

Experienced well drillers, either for sand or rock work. Permanent, steady employment with a postwar future at good wages. Washington Pump and Well Company, 201 L Street, Northeast, Washington 2, D. C.

Several Drillers. 4" and 6" wells only. Steady year-around work with new equipment. $1.25 hr., 48 hr. week, time and half for overtime. Lower Michigan. Box 4712

TOP-FLIGHT QUALITY UNDERGROUND
PEERLESS PUMPS



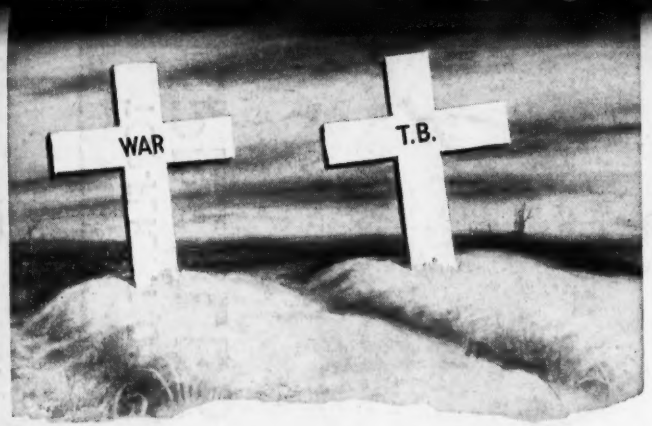
TURBINE TYPE
20 to 30,000 g.p.m.

HI-LIFT TYPE
10 to 55 g.p.m.

ARMY NAVY
PEERLESS PUMPS

Your drilled well represents an investment from which you want to derive the maximum return. Installed under the direction of experts, a Peerless water or oil-lubricated Turbine or water-lubricated Hi-Lift Pump will develop the top capacity of your well. Peerless ranks as the largest producer of deep well pumps. Such a record has endowed Peerless engineers with a knowledge of pump designing and manufacture second to none. In planning for your future water needs Peerless engineers and distributors are ready to give you every assistance.

PEERLESS PUMP DIVISION
FOOD MACHINERY CORPORATION
301 W. Ave. 26, Los Angeles 31, Calif. • 1250 Camden Ave. S.W., Canton 6, Ohio • *Other Factories:* San Jose 5, Fresno 16, California



TWINS OF DEATH

HAND IN HAND go War and Tuberculosis—the dread disease that since Pearl Harbor has exacted a toll of 145,000 civilians.

Wartime conditions — worry, overwork, abnormal eating and housing — are the *allies of TB.*

Yet Tuberculosis *can* be controlled. The annual sale of Christmas Seals has helped cut the death rate by 75%!

But the current death rate shows that the battle is *far from won* — that your dollars are needed now, urgently.

Please, send in your contribution today.

BUY CHRISTMAS SEALS!

The National, State and Local Tuberculosis Associations in the United States

DRILLER
A journal for water well drillers
SO. MILWAUKEE WIS. U.S.A.
U. S. POSTAGE
PAID
PERMIT No. 3

The John Crerar Library,
86 East Randolph St.,
Chicago, (1)
Illinois.

POSTMASTER: If returned, please note why (as required by Sec. 615 Postal Laws and Regulations), by checking the proper cause in the permissible list herewith.

☐ Does not receive mail here. ☐ Refused. ☐ Deceased. ☐ Unclaimed.

•If forwarded to new address, notify sender on form 3547.
Postage for notice guaranteed.

Return and Forwarding Postage Guaranteed

The Driller, South Milwaukee, Wisconsin

DRILLER
U. S. POSTAGE
PAID